

BRAUN 2-16-2  
13401-895

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

LINDA M. BRAUN ET AL.

Application No.: 10/081,350

Filed: February 22, 2002

For: METHOD AND APPARATUS OF  
MONITORING OPTICAL POWER  
LEVEL IN WAVEGUIDE  
STRUCTURES

Examiner: Omar R. Rojas

Group Art Unit: 2874

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

DECLARATION OF  
DR. JANE D. LEGRANGE UNDER 37 C.F.R. § 1.132

JANE D. LEGRANGE, a citizen of the United States and a resident of the city of  
Princeton, State of New Jersey, declares that:

I hereby certify that this correspondence is being deposited with the United  
States Postal Service as first-class mail in an envelope addressed to:  
Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on

NOVEMBER 26, 2003

Date of Deposit

Kelly Billingsley

Name

Kelly Billingsley

Signature

NOVEMBER 26, 2003

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1. I am an inventor of the method and apparatus of monitoring optical power level in waveguide structures disclosed and claimed in United States Patent Application Serial No. 10/081,350 filed on February 22, 2002. I have a Ph.D. in Physics from the University of Illinois, and have been engaged in research and development in the field of optics for nearly twenty years. I am currently a Member of the Technical Staff for Lucent Technologies, Inc. in the Photonics Applications and Development Department within the Government Communications Laboratory of Bell Labs. I am an inventor or joint-inventor of the patents, and I am author or co-author of the publications and presentations attached hereto as Appendix A.
2. In the Office Action mailed August 1, 2003, the Examiner alleges that “no specific method, device, or equation is disclosed [in the specification] for actually calculating the recited optical power from the temperature difference,  $T_1 - T_2$ . It would require undue experimentation for the ordinary skilled artisan to figure out exactly how to obtain the optical power using the method or device claimed in view of the application’s disclosure.” However, an ordinary skilled artisan can obtain power levels corresponding to the measured temperature differences  $T_1 - T_2$  by performing a simple calibration process, as discussed below.

3. With reference to the example in the patent application at page 4, lines 11-19 of a diode pump launching multimode light into the outer waveguide of a cladding pump fiber (cpf) device, the output power from the pump can be measured as a function of diode current, prior to splicing that fiber to the cladding pump fiber. The output fiber from the diode can then be placed in a calorimeter and the temperature difference measured as a function of diode current. The corresponding plot of power as a function of temperature difference can then be made. Alternatively, a splice can be placed in the calorimeter to improve the signal to noise ratio. For example, an undoped fiber that matches the cpf can be spliced to the output fiber of the diode pump. The output from the second fiber can be measured as a function of diode current. The two fibers and the splice are then placed in the calorimeter and temperature differences measured as a function of diode current. It is my belief that such calibration processes are well-known in the art and do not require undue experimentation.

4. All statements made herein and in the application of my own knowledge are true and all statements made on information and belief are believed to be true; all statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001, and that such willful false statements may jeopardize the validity of the application or any registration resulting therefrom.

Date: November 24, 2003 By: Jane D. LeGrange  
Dr. Jane D. LeGrange  
Member of the Technical Staff  
Photonics Applications and Development Department  
Government Communications Laboratory of Bell Labs  
Lucent Technologies, Inc.

## **APPENDIX A**

### **PATENTS:**

LeGrange, J.D. "Protective Coatings for Optical Devices Comprising Langmuir-Blodgett Films," #4,962,985 issued October 16, 1990.

Burack, J.J., LeGrange, J.D., and Townsend, W.P., "Composite Films with Langmuir-Blodgett Component," #5,024,873 issued June 18, 1991.

Burack, J.J., Fang, T., LeGrange, J.D., and Ors, J.A., "Method of Making Triazine Optical Waveguides," #5,165,959 issued November 24, 1992.

Burack, J.J., Fang, T., LeGrange, J.D., and Ors, J.A., "Triazine Optical Waveguides," #5,208,892 issued May 4, 1993.

Kollarits, R.V., LeGrange, J.D., and Miller, T.M., "Fast Transition PDLC Shutter for Display Screen and Method of Manufacture Therefor," #5,784,138 issued July 21, 1998.

LeGrange, J.D. and Walker, K.L., "Optical Communication System Comprising a Cladding Pumped Laser," #5,898,715 issued April 27, 1999.

LeGrange, J.D., Reed, W.A., and Walker, K.L., "Article Comprising an Improved Cascaded Optical Fiber Raman Device," #5,966,480 issued October 12, 1999.

Arney, S., Kosinski, S.G., and LeGrange, J.D., "Article for Detecting Power Drift in the Output of a Diode Array Source," #6,275,516 issued August 14, 2001.

DiGiovanni, D. and LeGrange, J.D., "Optical Waveguide Lasers and Amplifiers with Pump Power Monitors," #6,389,186 B1 issued May 14, 2002.

Arney, S. and LeGrange, J.D., "Splitter for Use with an Optical Amplifier," #6,430,343 issued August 6, 2002.

Holcomb, D.P., LeGrange, J.D., Tourgee, G.E., and Vogel, E.M., "Waveguide Lasers and Optical Amplifiers having Enhanced Thermal Stability," #6,456,637 issued September 24, 2002.

3 patents pending: in areas of amplifier design, high power multimode power monitors, and programmable delay line.

### **PUBLICATIONS:**

LeGrange, J.D. and Nordine, P.C., "Heterogeneous Fluorine Atom Recombination and Reaction on Several Materials of Construction," *AIAA Journal*, **14**, 644 (1975).

LeGrange, J.D. and Mochel, J.M. "High Resolution Heat Capacity Studies Near the Nematic-Smectic A Transition," *Physical Review A*, **23**, 3215 (1981).

LeGrange, J.D. and Mochel, J.M., "High Resolution Heat Capacity Studies Near the Nematic-Smectic A Transition in 8OCB," *Physical Review Letters*, **45**, 35 (1980).

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LeGrange, J., Cahen, D., and Caplan, S.R., "Photoacoustic Calorimetry of Purple Membrane," *Biophys. J.*, **37**, 4 (1982).

Hogan, M., LeGrange, J. and Austin, R., "Dependence of DNA Helix Flexibility on Base Composition," *Nature*, **304**, 752 (1983).

LeGrange, J., Caplan, S.R., and Cahen, D., "Simulations of Frequency-Dependent Photoacoustic Magnitude Signals and Their Implications for Bacteriorhodopsin Photocycle Energetics," *Biophysical Chemistry*, **20**, 249 (1984).

Austin, R.H. and LeGrange, J.D., "Amplification of Subnanosecond Light Pulses by a Synchronously Fired Nd-YAG Laser," *Rev. of Sci. Instr.*, **56**, 630 (1985).

Cobau, W.G., LeGrange, J.D., and Austin, R.H., "Kinetic Differences at Low Temperatures Between R-State and T-State Carbon Monoxide Carp Hemoglobin," *Biophysical Journal*, **47**, 781 (1985).

Berkoff, B., Hogan, M., LeGrange, J.D., and Austin, R., "Dependence of Oxygen Quenching of Intercalated Methylene Blue Triplet Lifetime on DNA Base Pair Composition," *Biopolymers*, **25**, 307 (1986).

Dierker, S.B., Murray, C.A., LeGrange, J.D., and Schlotter, N.E., "Characterization of Order in Langmuir-Blodgett Monolayers by Unenhanced Raman Spectroscopy," *Chemical Physics Letters*, **137**, 453 (1987).

LeGrange, J., Kuzyk, M.G., and Singer, K.D., "Effects of Order on Nonlinear Optical Processes in Organic Molecular Materials," *Molecular Crystals and Liquid Crystals*, **150B**, 567 (1987).

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LeGrange, J.D., Riegler, H.E., Zurawsky, W.P., and Scarlata, S.F., "Fluorescence Anisotropy Studies of Orientational Order of Langmuir-Blodgett Multilayers," *Thin Solid Films*, **159**, 101 (1988).

Riegler, J.E. and LeGrange, J.D. "Observation of a Monolayer Phase Transition on the Meniscus in a Langmuir-Blodgett Transfer Configuration," *Physical Review Letters*, **61**, 2492 (1988).

LeGrange, Jane D., Riegler, Hans E., Zurawsky, Walter P., and Scarlata, Suzanne F., "Orientational Order of Langmuir-Blodgett Films as Determined by Fluorescence Anisotropy," *Journal of Chemical Physics* **90**, 3838 (1989).

LeGrange, J.D., King, L.A., Singer, K.D., Katz, H.E., Schilling, M.L., "The Structural Stability of a Nonlinear Optical Material Fabricated by Langmuir-Blodgett Deposition," *Journal of Optical Society of America B*, **6**, 1946 (1989).

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LeGrange, J.D., Markham, J.L., and Kurkjian, C.R., "Effects of Surface Hydration on the Deposition of Silane Monolayers on Silica," *Langmuir*, **9**, 1749 (1993).

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Opila, R., LeGrange, J.D., Markham, J.L., Heyer, G., and Schroeder, C.R. "Effects of Surface Hydration on the Deposition of Silane Monolayers on Silica Optical Fiber," *J. Adhesion Sci. Technol.*, **11**, 1 (1995).

LeGrange, J.E., Miller, T.M., Wiltzius, P., Amundson, K.R., Boo, J., Vanbladeren, A., Srinivasarao, M., and Kmetz, A.R., "Brightness Enhancement of Reflective Polymer Dispersed Liquid Crystal Displays," *Society for Information Display International Symposium Digest of Technical Papers*, **XXVI**, 275 (1995).

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LeGrange, J., Vogel, E., Quoi, K., DiGiovanni, D., Hale, A., Pedrazzanni, R., Strasser, T., and Luvalle, M., "Optical Reliability of Cladding Pump Fiber for High Power Communication Networks," *IEEE Proceedings on Military Communications*, (1999).

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LeGrange, J., Beyers, R., Dutta, N. Ernst, R., Holcomb, D., Johnson, G., Kasper, A., and Watters, W., "Performance of High Power Amplifiers with Low-Duty-Cycle Modulated Signals," in preprint, 2002.

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Reith, L.A., Braun, L.M., Jankoski, C.A., LeGrange, J.D., Romeo, M. Santo, G. Schwarz, T. Smith, and E.M. Vogel, "Passive Component Performance at High Optical Powers," preprint, 2002.

#### **PRESENTATIONS:**

- "Flying Photons," 1999 World of Science Lecture, one in a series of public lectures given by Bell Laboratories' scientists, March, 1999.
- Invited presentations given at NSF Workshop on Nonlinear Organics, 1987, Gordon Conference on Thin Organic Films 1990, Optical Society of America national meeting 2002, university, government, and industrial laboratories.
- Contributed presentations given at meetings of the American Physical Society, Materials Research Society, Gordon conferences, conferences and workshops in thin organic films and nonlinear optical materials.